

PSYCHOLOGY TEACHERS UPDATE

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ISSUES IN HEALTH PSYCHOLOGY

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PSYCHOLOGY TEACHERS UPDATE

Psychology Teachers Update is designed to give a brief overview of the main developments in the different areas of psychology. There is a proliferation of journals and research, and it is very difficult to keep abreast of the latest trends, particularly in the many and varied areas of psychology.

Each issue of Psychology Teachers Update will cover a particular topic, and summarise the main research directions and findings in the last ten to fifteen years approximately. The aim is to give teachers the feel of what is happening in that area of psychology.

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Health Impairing Behaviour: Alcohol "Binge Drinking"

INTRODUCTION

A "Sunday Times" front page headline in March 2004 said "Drunken street violence out of control, admits government" (Winnett and Leppard 2004). The article talked about "drink-fuelled crime and disorder in Britain's town and city centres". This, as with many health issues, is the "crisis" story, but, with a calmer eye, what is the evidence about alcohol consumption and "binge drinking"?

An interim report of the Government's "National Alcohol Harm Reduction Strategy" estimated that binge drinking cost Britain £20 billion per annum as 8 million people drink twice the weekly recommended units of alcohol (Straight Talk News 2003).

The Government has recommended guidelines for sensible drinking of alcohol, which suggested weekly measures (21 units for men and 14 units for women) ⁽¹⁾, and then daily consumption levels (3-4 units for men and 2-3 units for women).

The latter were introduced because "weekly consumption can have little relation to single drinking episodes and may indeed mask short term episodes" (Department of Health 1995).

Government figures show "consumption on the heaviest drinking day in the last week" as well as overall weekly levels. Office for National Statistics (1999) found that 21% of men and 8% of women had drunk "heavily" (males greater than 8 units and females greater than 6 units in one sitting) on at least one day in the previous week in 1998. In the 16-24 years age group, the figures were 37% for men and 23% for women.

These official figures use 8 units for men and six for women as "heavy" drinking, but there are no agreed definitions for "binge drinking".

For example, Broomfield et al (1999) used "10 or more drinks in one session" (1 drink = standard measure of 7.9g of ethanol), while Raistrick et al (1999) preferred to use drinking over half the recommended weekly number of units in one session (ie: 10 for men and 7 for women). However, the quantity of alcohol consumed will be mediated by factors like level of tolerance for alcohol, and gender.

Another approach to defining "binge drinking" is to distinguish between "responsible" and "reckless" drinking

behaviour (International Centre for Alcohol Policies 1997) ⁽²⁾. This definition in practice is too subjective. Likewise, the Alcohol Concern (2001) definition of "drinking sufficient alcohol to reach a state of intoxication on one occasion or in the course of one drinking session". Murgraff et al (1999) used "risky single occasion drinking" (RSOD).

Individuals have often gone out on a Friday and/or Saturday evening to have a good time, part of which is ending up intoxicated. The task is to establish whether drinking behaviour is different when called "binge drinking". Is it a new phenomenon, or a new term for an already-existing behaviour? In the past, the term "episodic drinking" has been used.

PREVALENCE OF "BINGE DRINKING"

Because of the problems of finding an agreed definition, it is easier to use the official Government definition of "heavy" drinking - half the weekly recommended units in one session. Bearing in mind that survey findings have limitations, studies have tended to concentrate on young drinkers (below 25 years old) compared to the rest of the population.

1. Prevalence of "binge drinking" ever

a) Among young people

The Health Education Authority (1997) surveyed 1600 adults in 1996, and, among 16-24 year-olds, found that the majority had drunk "heavily" at least once in their lives - 81% of male drinkers, and 60% of females.

McKeganey et al (1996) interviewed 758 12-15 year-olds in Dundee on their preferred alcoholic drinks (257 of the sample did not drink). For the new "designer drinks", 86% had "ever drunk" them, and the average amount consumed at the last occasion was 10.6 units. For vodka, the figures were 80% and 9.9 units, 86% and 12.7 units for fruit wine respectively.

b) Among general population

Williamson et al (2003) made use of approximately 21 000 unrelated individuals (aged over 20 years old) of the GENESIS (Genetics and Environmental Nature of Emotional States in Siblings) study in the UK. They found that 17% of the sample could be classed as "binge drinkers" (males greater than eight units and women 6 units per drinking

session).

Of those, 63% "binge drank" at least once a week, and 76% at least once a fortnight. This study found an overall "binge drinking" rate of 15% for men and 18% for women. This is interesting because usually more men than women are found to be "binge drinking" (eg: Office for National Statistics 2002: 21% of men and 16% of women).

The GENESIS study confirmed that "binge drinking" is more common among younger people (33% of men and 36% of women in their 20s), but did find that approximately 6% of individuals in their 50s admitted "binge drinking".

2. Regular "binge drinking"

a) Among young people

In the Health Education Authority (1997) study, just under half of male drinkers had drunk "heavily" at least once a week in the preceding year, compared to 15% of female drinkers.

In a younger age group (14-16 years old), over a two-year period, Measham (1996) found an increase in those "heavy drinking" (11-40 units) from 22% to 31% of the sample, while "light drinking" (1-4 units) had declined. This suggests a shift to increased drinking.

Among second year undergraduate students at ten UK universities, Webb et al (1996) found that 42% of male and 26% of female students regularly exceeded daily recommended levels. "Binge drinking" was calculated at 31% and 24% respectively.

Richardson et al (2003) used data from the Youth Lifestyle Survey (YLS) 1998-9 and 27 indepth interviews with "binge drinkers". They classed 39% of the sample as "binge drinkers" (defined here as very drunk more than once per month) (48% for men and 31% for women).

b) Among general population

A study of nine Welsh health districts found that 28.2% of men and 8.2% of women reported "binge drinking" at least weekly (Moore 1994). This study also found that "binge drinking" was associated with other risky health behaviours - smoking, and being overweight.

Among ethnic minorities, "on the heaviest drinking day in the last week", 74% of Irish men drank over 4 units, 50% of Indian, 43% Black Caribbean, and 21% Chinese (compared to 59% for the population as a whole) (Alcohol Concern 2003) ⁽³⁾.

EFFECTS OF "BINGE DRINKING"

The effects of "binge drinking" can be divided into three groups: long-term health effects, behavioural consequences, and long-term alcohol problems.

1. Long-term health effects

A Finnish study (Kauhanen et al 1997) showed that "binge drinking" could explain the increased risk of mortality among middle-aged men better than the total alcohol consumed. Men who usually binged on six or more bottles of beer had a relative risk of death 3.01 times greater, and of sudden cardiac death (fatal myocardial infarction) 6.5 times greater than those men who usually drank three bottles or less (4).

While McKee and Briton (1998), in a study of Moscow men, looked at the relationship between "binge drinking" and sudden cardiac death at weekends. They found that "binge drinking" affected the heart in a number of ways including changing the type and density of lipoproteins in the blood, and causing high blood pressure (hypertension).

It has also been argued from research in Scotland that the increased number of deaths from coronary heart disease on Mondays (3% above the daily average) was partly attributable to weekend "binge drinking" (Evans et al 2000).

However, it should be noted that there are few longitudinal studies that establish the exact relationship between alcohol consumption and the development of diseases (Murgraff et al 1999).

2. Behavioural consequences

Alcohol consumption as well as "binge drinking" has been associated with a number of behaviours (Alcohol Concern 2001):

- Accidents: alcohol is implicated in 20-30% of all accidents;
- Violence: an increased vulnerability of "binge drinkers" to violent injury as shown in a study of Cardiff and Bristol hospitals (Shepherd and Briskly 1996);
- Unsafe sex: alcohol is associated with 1 in 7 acts of unsafe sex (ie: without use of a condom) among 16-24 year-olds questioned by Health Education Authority

in 1998.

3. Long-term alcohol problems

The general assumption is that "binge drinking" is a feature of young people in the main. However, studies have shown that such patterns of drinking remain, particularly related to adverse life events.

For example, Moore (1994), in a Welsh study, found that 29.6% of separated and divorced people engaged in weekly binges, compared to 33.9% of single people and 17.9% of married. Alcohol Concern (2001) feel that "'binge drinking' is not simply a youthful phase but a possible precursor of later, harmful drinking behaviour".

In the Moore study, 41-43% of those who binged regularly accepted that it was harmful to health, but only 24.4% of men and 31.0% of women admitted wanting to cut down.

MOTIVATIONS FOR "BINGE DRINKING"

Traditionally heavy alcohol use in young people has been associated with deviance; ie: another symptom of delinquency, like cigarette smoking and illegal drug use. Such individuals were different to the average, having, for example, experienced damaged childhoods, educational underachievement, and unemployment (Eggington et al 2002).

But recent research has suggested that "binge drinking" is a behaviour of a "predominately normative population", and is part of poly-substance-taking (including cigarettes and illegal drugs) (Eggington et al 2002). This behaviour is part of the "going-out sector" where great significance is placed upon leisure time (Parker et al 1998). A key difference today is increasing disposable income (Petry 2000) in the face of a selective of "easy-to-drink high-ABV (alcohol by volume), designer products to choose from" (Eggington et al 2002). "Heavy" drinkers (ie: drinking the recommended number of units per week) can spend £50 per week on alcohol (Eggington et al 2002).

Richardson et al (2003) found in the Youth Lifestyle Survey that the motivations to "binge drink" were "linked to personal freedom and independence and a desire to escape from everyday worries". Increased confidence, feelings of invulnerability, and not caring when drunk were reported as positive aspects of the experience (5).

In the Northern Regional Longitudinal Study (NRLS) of two cohorts of young people in Northern England,

Eggington et al (2002) found a selection of reasons given by individuals for alcohol consumption. Drinkers emphasised the role of alcohol in stress-reduction, and saw getting drunk as a desirable outcome. Note that the reasons given were similar for heavy and light drinkers (table 1).

	HEAVY DRINKERS*	LIGHT DRINKERS**
1. Drink to celebrate	95.7%	91.8%
2. Drink for pleasure	90.0	76.8
3. Drink because like taste	81.0	76.2
4. Drink because makes feel good	60.9	51.9
5. Drink to wind down	58.1	41.6

* drink above recommended number of units per week

** drink less than half recommended units per week

(After Eggington et al 2002)

Table 1 - Five main reasons for drinking alcohol by 17/18 year-olds in NLRs.

"For the going-out group...heavy regular drinking is nominated as a self-medicating behaviour to celebrate time out and mediate the stress and pressures associated with the working-studying week" (Eggington et al 2002 p133). In other words, "work hard, play hard", as a young Manchester advertising executive says. She also adds: "I defy any female to have fun on the recommended 14 units a week or whatever the medical professional says" (Leppard and Winnett 2004).

Furthermore, Collins et al (1998) found that excessive drinking occurred when drinkers were in a positive mood at the beginning of the drinking session with friends.

The role of peer pressure must also be considered. Prentice and Miller (1993) have noted that students may have private reservations about heavy alcohol use, but keep them hidden because of public norms that support such drinking behaviour. This can be seen as a form of "pluralistic ignorance" (Suls 2003) (6).

FOOTNOTES

1. "Health of the Nation" (Secretary of State for Health 1992) targets set to reduce the number of men drinking more than 21 units per week from 28% in 1990 to 18% in 2005, and for females drinking more than 14 units per week from 11 to 7%.

2. Steadman (2004) notes that the American Medical Association (AMA) has criticised the ICAP for disagreeing with US health guidelines on "hazardous drinking".

3. There are general problems with prevalence studies:

i) Use of self-reported questionnaires and accuracy/honesty of response. Possible underestimation using retrospective self reports based on accuracy of recall, and honesty of replies to "official" questionnaires. There is also the tendency to underestimate unhealthy practices - a "better than average effect" (Suls 2003); ie: the belief that personal risk of incurring health problems is lower than average. At the same time, there is evidence of a false consensus effect (FCE) (Ross et al 1977); ie: the belief that own behaviour is typical. Alternatively, there may be overestimated reports as part of "bravado".

ii) No agreed definition of "binge drinking".

iii) Measurement of units of alcohol - for example, beer is usually calculated as two units, but premium lagers and stronger beers contain more alcohol. Also some drinks are not comparable in reality, like wine with beer.

iv) What alcohol is consumed - studies can underestimate "binge drinking" if drinkers have a mixture of beer, wine, and spirits.

v) The sample size and representativeness used in each study.

4. Relative risk (RR) is calculated as prevalence in one group divided by prevalence in another group (Hart 2001)

5. One sociological explanation for the importance of time out is the "proletarianism of the professions" (Pahl 2001). Since the 1973 oil crisis, there has been a threat to the security of the "job for life" among the professions. Margaret Thatcher then in 1980s challenged the power and status of the professions in Britain. This has led to a change to "making money" as status as everything is given a monetary value.

With the increasing insecurity of all professions, work is done for the monetary reward only. The idea of a "professional ethic" becomes meaningless because it has no monetary value. If work is for money only, the aim becomes to survive to the end of the week in order to enjoy pleasure. Employment, even in the professions, is a means to an end - money for pleasure. This has been the behaviour of manual workers traditionally, where there

was little job satisfaction. It is now the behaviour of the professions.

6. Publications and information about alcohol related issues and misuse can be obtained from Alcohol Concern, Waterbridge House, 32-36 Loman St, London SE1 0EE (020-7928-7377).

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Health Behaviour Change: Tobacco Smoking Cessation

INTRODUCTION

"The Health of the Nation" (Secretary of State for Health 1992) set targets to reduce smoking to less than 20% of the population over 16 years old, and the number of children smoking from 13% to 9% by 2010. Recent Government figures calculated that 28% of men and 26% of women smoked in Britain in 2001 (Office for National Statistics 2002).

Attempts to understand and change health behaviour have focused, in recent times, on the idea of different stages and motivations to encourage change, and on highlighting the factors that cause lapse or relapse behaviour. One popular example is the Transtheoretical Model of Behaviour Change (TTM) (DiClemente and Prochaska 1982).

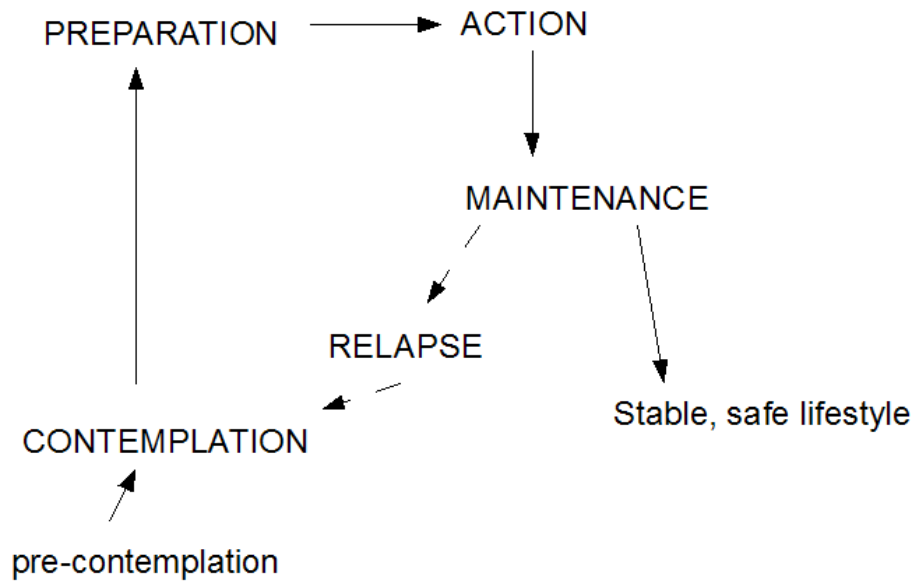
The TTM has a number of stages in the health behaviour change process, and, at each stage, different factors will be important. The stages are (figure 1):

1. Pre-contemplation - no motivation to give up; eg: refuse to admit unhealthy.
2. Contemplation - seriously thinking of quitting (within next six months); accept that behaviour is health risk, and need encouragement and support.
3. Preparation - decision to quit (within next six months).
4. Action - period of stopping.
5. Maintenance - continuation (abstinence for longer than six months).

Each stage is seen as qualitative difference. As well as the stages, there are ten processes of change.

But Sutton (2000) has particularly criticised the lack of distinctiveness of each stage, and Kraft et al (1999) found a lack of support for the stages among Norwegian smokers.

Aveyard et al (1999) reported a project in the West Midlands with 13-14 year-old smokers. Those given information about the stages of cessation and what to do to move to the next stage showed no difference in cessation compared to the classroom health education group.



(After Baird 1998)

Figure 1 - Transtheoretical model of behaviour change.

REVERSAL THEORY

Health concerns over tobacco use are well-known ⁽¹⁾. Smokers themselves are aware of many of them, and would like to quit. However, this is a problem - as much as 70-80% of adults are unsuccessful in their attempts to quit (Mendez et al 1998). Abstinence for greater than six months, which is a definition of quitting often used, is as low as 7% among adolescents (Burris and O'Connell 2003).

Burt and Peterson (1998) surveyed 1240 adolescent smokers, and found that 67% wanted to quit. Of the total group, 60% had tried to quit in the past 12 months, with 40% maintaining cessation for a week or less. For those adolescents who quit for six months, 28% resumed smoking within the following 12 months. The concern in health psychology is to explain the psychological factors in succeeding or failing to quit smoking.

Burris and O'Connell (2003) applied reversal theory (Apter 1982) to understand smoking cessation. Reversal theory involves opposing states of mind called "meta-motivational states" which occur in pairs, but only one operates at one time, and individuals can switch between them. The "meta-motivational states" are universal and are derived from basic psychological desires and values.

They are linked to emotions, and are specific ways of viewing the world (Apter 1997).

There are four pairs of "metamotivational states", which combine to give sixteen primary emotions:

- i) telic (serious-minded) vs paratelic (playful);
- ii) negativistic vs conformist;
- iii) sympathy vs mastery;
- iv) autic (self-centered) vs alloic (other-centered).

Individuals have different motivations for their behaviour in different "meta-motivational states". Thus in the telic state, individuals will be serious-minded and pursue important goals, like quitting smoking. While the paratelic state is playful, including pursuing an activity for its own sake or for the thrill (2).

In this latter state, the motivation for cessation will lapse. The key is to give smokers different advice to combat temptation in different states. For example, in a telic state, relaxation techniques could be helpful, but in the paratelic state, distraction through playing video games would be better. The wrong technique when an individual is in a particular state will be ineffective.

What are the factors that lead to a lapse in smoking cessation? Not surprisingly, "smoking cues", like seeing others smoke or being in a place where smoking is permitted (Shiffman et al 1996) are important. But also the availability of cigarettes.

Burris and O'Connell (2003) interviewed 62 adolescent smokers attempting to quit at Arkansas high schools (3). The availability of cigarettes when tempted to lapse was important when individuals were in a paratelic state. However, in this state, the lack of availability of cigarettes would mean a change to the telic state in order to get some (goal-directed behaviour = serious-minded). Individuals in the telic state during temptation would be more likely to expend energy to get cigarettes when not available. Table 2 summarises the situation for smoking lapses, and predicted the outcome on 80% of episodes.

Those individuals in the paratelic state at the time of temptation were much more likely to lapse compared to the telic state (odds ratio 15.36) (4), and cigarette availability predicted lapses more than when unavailable (odds ratio 4.61). The same factors have been found with adult smokers (Cook et al 1995).

	TELIC STATE	PARATELIC STATE
CIGARETTES AVAILABLE	No lapse because motivation to quit is serious	Lapse
CIGARETTES NOT AVAILABLE	Motivation to find cigarettes because this goal-directed behaviour = lapse	No lapse because not motivated to find cigarettes

Table 2 - Lapses in motivation to quit smoking based on "meta-motivational states" and availability of cigarettes.

NARRATIVES OF IDENTITY

Although there are smokers who want to quit, there are many who do not. One factor that influences the desire to quit or not is the role of smoking in the individual's self-identity. This may be as simple as an individual defining themselves as "smoker" or not, irrelevant of the number of cigarettes smoked each day.

Identity is key for adolescents in beginning and cessation of smoking. Lloyd et al (1997) found that teenage girls view smokers as fun-loving and non-conformist, but have a less positive self-identity than non-smokers (Lloyd and Lucas 1998).

While Mitchell and Amos (1997) found that 11-13 year old girls who smoked were seen as at the top of the "playground hierarchy" by their peers in a Scottish sociometric study. For these girls, smoking was linked to perceived high self-esteem, but this was not the same for boys.

The role of smoking in identity formation can outweigh awareness of health risks (Denscombe 2001); eg: "looking cool" or smoking to show not afraid of risks. Plumridge et al (2002) have shown, from discourse analysis of interviews, that adolescent non-smokers' identity is also constructed in relation to the view that "smoking is cool".

Johnson et al (2003), through analysis of indepth interviews with thirty-five 14-18 year-olds (all who had tried smoking), have found that there are a variety of identities of "smoker" and "non-smoker". This type of qualitative research aims to understand the individual's "narratives"; ie: the telling and retelling of certain stories to make sense of who they are (Clandinin and Connelly 2000).

The Johnson et al research showed seven different key identities from the interviews:

i) "confident non-smoker" - these individuals emphasised that smoking did not "fit" their lifestyle (eg sports);

ii) "vulnerable non-smoker" - individuals who did not currently smoke, but "Cigarette smoking was portrayed as ever present and as something that could overcome them at anytime" (p392). Frequent references were made in the interviews to the positive aspects of smoking (eg: "glamorous"), and the possible "need" to smoke in the future;

iii) "ardent non-smoker" - the individuals in this group emphasised that smokers were "not cool" or "stink". Interestingly, "they portrayed themselves as the envy of smokers because they were strong enough to resist the smoking habit" (p392);

iv) "accepting non-smoker" - an acceptance of smoking, but no desire to smoke themselves at the moment;

v) "in-control smoker" - these individuals were smokers but only in certain situations, like at a party. They saw smoking as an "accessory" or tool to help in socialising: "The cigarette would be the outfit I would wear to the bar, but it's not the outfit I would wear to school (17 year-old female, smoker)" (p393). There were references to strategies to monitor the amount smoked to ensure not addicted;

vi) "confirmed smoker" - here was an adoption of the identity of a smoker. There was some awareness of health risks, but any thoughts of cessation were "vague and future oriented" and "imaginary or whimsical";

vii) "contrite smoker" - this last identity contained individuals who smoked, but felt guilty about it. "They did not want to be smokers, nor did they want to see themselves as smokers" (p394).

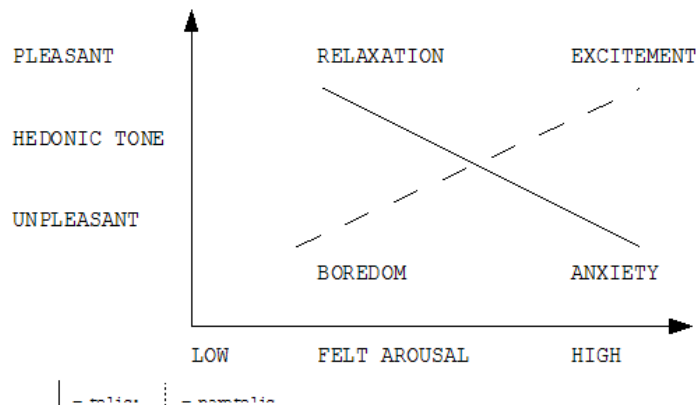
The different "narratives of identity" about smoking were also ambivalent, and not a "simple binary identity that one turns on or off" (Johnson et al 2003 p396). Knowledge of these identities can help in the development of smoking cessation techniques and programmes, and health education.

Recent research, summarised in Rise (2004), showed that adolescent smoking is influenced by factors different to adults (eg: higher prices of cigarettes), as well as those similar to adult smokers (eg: effectiveness of mass media anti-smoking campaigns).

FOOTNOTES

1. The health risks include heart disease, stroke, and various cancers (Massachusetts Medical Society 1998).

2. Telic and paratelic states are linked to levels of arousal and pleasant/unpleasant emotions (figure 2).



(After Apter 1997)

Figure 2 - Reversal theory and telic/paratelic states.

3. Their "meta-motivational states" were measured by "The Metamotivational State Interview and Coding Schedule" (MSICS) (O'Connell et al 1991).

4. Odds ratio gives the relative odds of behaviour in two groups. It can be defined as the "ratio of affected to unaffected individuals in one group divided by the same ratio in another group" (Petrie 1987 p230).

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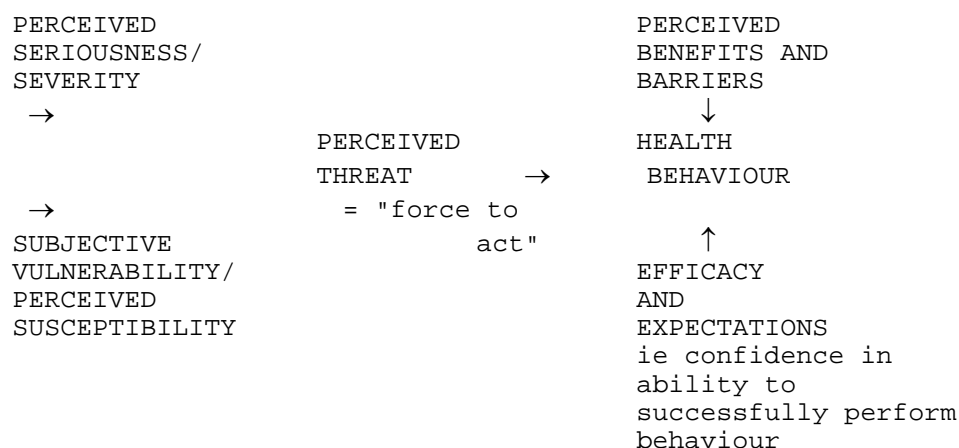
Perception of Risk and Risky Health Behaviour

RISK PERCEPTION

The British Medical Association (1987) defined a "hazard" as "a set of circumstances which may cause harmful consequences", and "the likelihood of its doing so" is known as "risk". In other words, there is a clear danger that can or should be avoided. This is more straightforward, it would seem, for the risk of an accident, but how can the idea of risk and harm be applied to health-related behaviours? What is involved in the perception of health risk, or in performing risky health behaviour?

Risky health behaviours include problem drinking, substance abuse, smoking, reckless driving, and unprotected sexual intercourse. Most of these behaviours can be controlled or eliminated by changes in health behaviour.

Changes in behaviour related to health will be linked to the perception of risk. A number of models have attempted to formalise the relationship, of which the best known is the Health Belief Model (HBM) (Becker 1974). Part of the model is based around "perceived threat" which is a combination of "perceived seriousness or severity" and "subjective vulnerability/perceived susceptibility" (figure 3).



(After Weitekunat et al 2003)

Figure 3 - Health Belief Model

What is interesting in terms of risk perception is to focus upon the "perceived threat" in the HBM, particularly in situations where accurate scientific

measures of risk are not available. In other words, it is not clear what the individual risk actually is likely to be. One example here is the eating of beef (and meat generally), and the concern about bovine spongiform encephalopathy (BSE). In scientific terms the probability of transmission of a disease to humans (in the form of variant Creutzfeldt-Jacob disease; vCJD) is not known, nor the future number of people affected. The number of deaths from vCJD currently is 10-20 cases per year (Weitkunat et al 2003). How will beef consumption be perceived in such a situation of "prognostic vagueness"?

Weitkunat et al (2003) performed over 1000 telephone interviews in early 2001 in Germany to assess the perceived risk. In Germany, BSE was a major event of public attention in late 2000 and early 2001. The strongest behavioural finding was that approximately 40% of the respondents reported eating less beef at the time of the survey compared to the previous year. Also meat consumption generally was reported as down. In relation to the threat of BSE, 7% of respondents reported feeling "very strongly threatened" and 12% "strongly threatened". These groups were at least twice as likely to change their behaviour than those individuals not feeling threatened by BSE.

Perceived threat here is not a rational attitude, but is an emotional variable (ie: "sheer fear"). Weitkunat et al (2003), however, noted that meat consumption and perceived threat had returned to pre-BSE crisis levels by late 2002. They argued that the changes in dietary behaviour were "panic-driven".

McCaul and Mullens (2003) noted that affect was missing from the HBM: "If feelings and emotions have anything to do with health-protective actions, one would not know it from the HBM" (p140).

For some individuals in the Weitkunat et al study, there was an exaggeration of the personal risk. This is different to the idea of unrealistic optimism about personal risk (or optimism bias) which appears in the literature ⁽¹⁾. This is the tendency of individuals to see themselves as being less likely than others to experience health problems in the future (Weinstein 1980). This has also been called the "illusion of safety in a risky world" (Thompson et al 1996).

Renner et al (2000), for example, asked participants to estimate their own and an average peer's risk of cardiovascular diseases. All age groups rated their own risks below average, except the 60 years and above group. However, this group still rated their risk as less than the average peer. For example, the 31-40 years age group gave a mean absolute risk judgement of -0.54 for

themselves and -0.17 for the average peer (where average risk is zero), while the 51-60 years group estimated -0.24 and +0.34 respectively.

Weinstein (1987) found the optimism bias for risk judgements with 32 different behaviours in a telephone survey, varying from food poisoning, tooth decay, and diabetes to mugging.

UNDERSTANDING RISK INFORMATION

The decision to change health behaviour is assumed to be based upon information about the risks. Thus public health campaigns are seen as risk communicators. In other words, give people the facts, and they will respond to them.

However, it is clear that risk is not perceived in objective and statistical terms by individuals because of "judgemental biases" (Chapman and Elstein 2000). Health professionals see the response of laypeople to risk information as "irrational". Yet from the position of psychology, this is not unusual behaviour as shown with attributional processes in social psychology. A key process in risk assessment for the layperson is their misjudgement of risk information.

For example, the probability of an event occurring is often used in health information. Weinstein (2000) found that individuals did not distinguish between varying degrees of likelihood of, say, 80% chance of happening and 50% chance of happening, and reacted in the same way. But in statistical terms, there are big differences between the likelihood of those two events occurring.

Similarly there is misunderstanding over how risk increases over time with repeated events (eg: the difference in risk between unprotected sexual intercourse on one occasion and many occasions), and how different risk factors combined to provide overall risk (eg: heavy alcohol consumption and heavy smoking) (Renner and Schwarzer 2003) ⁽²⁾.

MISUNDERSTANDING RISK AND MMR VACCINATION?

The difference in how risk is perceived between medical and health professionals and ordinary individuals can be seen in the current public concern over the MMR (measles, mumps, and rubella) vaccination in the UK.

In response to this concern, the Government produced the leaflet entitled "MMR The Facts" (Health Promotion England 2001), and funded a series of television advertisements. Hobson-West (2003) analysed the

assumptions made by the Government (and health and medical professionals) as to how individuals are thought to assess risk, and thus why they believed many individuals are refusing the MMR vaccination for their children.

Hobson-West noted three assumptions made by the Government:

i) The assumption that individuals make decisions through a comparison of individual risk.

"MMR The Facts" emphasised that vaccination is "the safest way for parents to protect their children", and thus parents need details of the risks to make their assessment. The comparison of statistics, like 1 in 200 risk of convulsions naturally against 1 in 1000 risk after the MMR vaccination, are used to "make risk visible" (Prior et al 2002). The comparison of risk statistics is based upon an assumption of rational decision-making.

Hobson-West noted that the decision to have a child vaccinated is not a one-off decision, but is part of a process, and has similarities to compliance behaviour in other aspects of medicine - for example, the importance of past experience of vaccinations and the health service.

Furthermore, the emphasis upon the individual decision to vaccinate is related to the social context with the dominance of the language of choice, empowerment, and individual responsibility in health discourses (Petersen and Lupton 1996).

Fox (1998) noted how the perception of risk is closely linked to the perception of individual choice among medical staff who risk infection from blood-transmitted disease by accidental needlestick injury. Risk is seen as part of health, and health is part of "lifestyle", and thus "a risk can be an opportunity for transformation" (p684).

ii) The assumption that individuals have made a miscalculation of the risk.

Health and medical professionals can assume that biases or distortions are at work in individual's thinking about risk, and it is a question of removing those biases. But, in practice, individual's behaviour may be based upon other factors than rationality - for example, "positive health" (Martin 2000). "Some resistance to vaccination may therefore signify a fundamental opposition to the dominant biomedical

understanding of health and disease" (Hobson-West 2003 p278). So the issue for the individual is not just about risk, but about alternative meanings of health and illness.

In fact, the debate for the individual is not necessarily "risk vs benefits", as the health and medical professionals assume, but another dichotomy, like "uncertainty vs need" (Hobson-West 2003). The health and medical professionals' response to uncertainty is to make the "incalculable calculable" (Beck 1994) by the application of risk statistics; and to see uncertainty as a temporary phase that can be overcome by more research.

iii) The assumption that the provision of more risk statistics is what individuals want or need.

In terms of medical research, there are no shortage of studies that show no link between the MMR vaccination and the development of autism in children (Petit-Zeman and Le Page 2002) ⁽³⁾. But the quantity of research is meaningless if trust is the issue for individuals.

The psychology of persuasive communication generally, and specifically in health, emphasise the importance of the evaluation of the source of the message as carrying more weight than the content (Brewer 2003; Bennett and Calman 1999).

If some of us no longer trust our individual doctor or the government committees that investigate vaccination safety, then more risk statistics (or any advice for that matter) will not be automatically accepted (Hobson-West 2003 p280).

As to why the Government (or professionals) are not trusted is open to debate. For example, Giddens (1994) talks about the debunking of experts in "late modern" or "post-modern" society ⁽⁴⁾.

"Powerful social forces shape the way in which information is perceived and acted upon" (Grinyer 1995 p49). This goes hand in hand with what Beck (1992) described as a "risk society". In this type of society, all behaviour is perceived in the context of "all-pervading risk", and the "risk to health comes from the individual's presence or absence of self-control which manages and masters the changeable drives that expose the body to threat" (Ogden 1995 p413). For example, the risk is not from HIV as a disease, but from the individual's failure to control their sexual behaviour.

Furthermore, whether to vaccinate a child or not is grounded in the discourses of parental responsibility. "Parents are not only responsible for caring for children they are also held responsible for their children's well-being and conduct and are thus accountable if their children are victimised or if they victimise others" (Scott, Jackson and Backett-Milburn 1998 p702). In other words, if the MMR vaccine did cause autism (or other health problems), the parents would be seen as responsible.

RISK-TAKING BEHAVIOUR: CONDOM USE AMONG HETEROSEXUAL INDIVIDUALS

Leaving aside the problems in establishing how individuals perceive risk, there is the question of how the perception (underlying cognition) links to the actual risky behaviour. One area in particular is well researched here, and that is unprotected sexual intercourse (both among heterosexual and homosexual populations).

Theoretical models have been developed to try and understand the underlying cognitions in relation to health behaviour. These models include the social cognition theory (Bandura 1986), the theory of reasoned action (Ajzen and Fishbein 1980), and the theory of planned behaviour (Ajzen 1985).

From research based on these models, certain factors appear key to health behaviour, including self-efficacy and outcome expectations. In other words, does the individual feel in control of the behaviour, and what are the likely outcomes of doing or not doing a behaviour?

Focusing on risky sexual behaviour, studies have looked at condom use in relation to the risk of HIV or unplanned pregnancy among heterosexual partners ⁽⁵⁾. Recent studies attempt, through complex statistical modelling (eg: hierarchical regression analysis), to isolate the variables between the use or lack of use of a condom during sexual intercourse.

Such studies suggest the following factors in condom use:

- Beliefs; eg: condoms interfere with sexual pleasure;
- Factual knowledge about AIDS, for example;
- Skills in condom use, including the confidence to demand a condom by one partner ⁽⁶⁾;
- Perceived peer norms of condom use (Koniak-Griffin et al 2003).

A specific recent example of research comes from Koniak-Griffin et al (2003). They looked at condom use among over 500 female adolescents in California, who were currently pregnant (67% of the sample) or already had a child. The majority of the sample were Latinas.

Table 3 shows the variables found to be associated with condom use (out of 25 variables examined). No association was found for maternal age, age at first coitus, number of previous sexual partners, or knowledge about HIV/AIDS.

VARIABLE	RELATIONSHIP WITH CONDOM USE
- Behavioural intention to use condom	positive correlation
- Pregnant	pregnancy = less use
- Having steady partner	steady relationship = less use
- Church service attendance	negative correlation
- Ever having anal sex	negative correlation

Table 3 - Variables associated with condom use in Koniak-Griffin et al (2003) study.

Generally the results show a high level of risky sexual behaviour with an average number of seventeen unprotected sexual episodes in the previous three months, and only 18% of the sample reported condom use at last intercourse.

RESILIENCE AND RISKY BEHAVIOUR

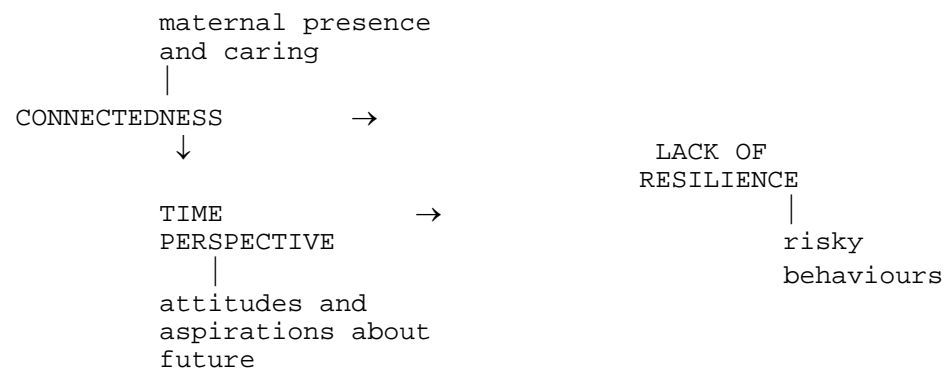
The level of risk-taking behaviour will vary across the population. For example, risky sexual activity (eg: without contraception) leading to unplanned pregnancy is highest among adolescent females in the USA (Kids Count Data Book 2001). But the level of risk-taking will also vary within the adolescent population, and is higher in poorer urban areas in numbers participating, and younger in age of beginning such behaviour than those in higher socio-economic groups (Levy et al 1995).

The experience of poverty can lead to marginalisation from mainstream society, the perception of a pessimistic future, and greater participation in risky behaviour (Ginsberg et al 2002).

In other words, risky behaviour is associated with a sense of despair and hopelessness about the future. However, there are still individuals in these situations who do not participate in risky behaviour. This is known as resilience (Brooks-Gunn and Paikoff 1993).

Thus there is an interest in what factors are linked to resilience in adolescents. Research highlights the importance of parental supervision and presence (Steinberg 2001), and "connected" relationship with adults where the adolescent feels cared for (Werner and Smith 1992), combined with a positive attitude about the future (Rothspan and Read 1996).

Aronowitz and Morrison-Beedy (2004) tested a model of these factors, and resilience to risky behaviour generally (figure 4).



(After Aronowitz and Morrison-Beedy 2004)

Figure 4 - Model of maternal connectedness, time perspective, and lack of resilience.

The researchers concentrated on mother-daughter "connectedness" among African American girls aged 11-15 from impoverished inner city areas (using data for over 400 adolescents from the National Longitudinal Survey of Youth; "Add Health" study).

Significant negative correlations were found between "maternal caring" (perceived care and attention from the mother) and sexual behaviours, delinquent behaviours, and violent behaviour. Similarly, negative correlations for "maternal presence" (frequency of mother's presence at home during points in the day) and delinquent behaviours, substance use, and violent behaviour. The feeling of closeness by the girls to their mothers was the key to "connectedness", and consequently to fewer risky behaviours via future time perspective.

In contrast to earlier studies, Aronowitz and Morrison-Beedy found no direct relationship between maternal "connectedness" and resilience.

FOOTNOTES

1. For example, Rutter et al (1998) found that motorcyclists in the UK underestimated their likelihood of an accident compared to the average.

2. Special issue on communication of risk by doctors in "British Medical Journal" 24/9/03.

3. The research suggesting a link between the MMR vaccination and autism (and bowel problems) appears in Wakefield et al (1998). Summaries of the debate and medical evidence appear in, for example, Ellman and Bedford (2001), Kaye et al (2001), and Le Page and Ainsworth (2001), and Tidmarsh (2003).

4. One of the characteristics of this situation is that personal opinion is elevated to equality or even above scientific evidence (Speers 2003).

Modern society has also been called "post-modern" with the presence of conflicting ideas (Brewer 2002).

Different experts tell different stories, and this produces a tendency to trust no one and to become our own experts, drawing on whatever sources of information are available to us, for example the media (Scott, Jackson and Backett-Milburn 1998 p690).

5. Examples of research on condom use among homosexual men include Janssen et al (2001), and Vincke et al (2001). High risk sexual behaviour variables among gay men include knowledge of risks, condom acceptability, significance of anal intercourse, social norms, beliefs of friends and lovers, communication about safe sex with partner, perceived difficulty of changing one's behaviour, and personal efficacy.

6. Often it is difficult for women to ask their male partner to use a condom. Holland et al (1990) interviewed a number of young British women on this subject, and found either embarrassment about asking, or if women carried condoms in their purses, this indicated that the women were "slags".

Gupta (2002) has found the situation even harder for women in sub-Saharan Africa. The response of men in such situations can be violent, as well as incorrect beliefs about condoms. For example, in rural South Africa, there is the fear that the condom will fall off during intercourse and travel around the woman's body.

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Fear, Worry and Health

FEAR AND HEALTH MESSAGE FRAMING

The traditional view about the use of fear to motivate health change is a curvilinear relationship with small or moderate levels of fear producing the greatest effects (eg: Janis and Feshbach 1953). Thus the simple fact is that individuals cannot be scared into performing health benefiting behaviour. Recent research has added the cognitive assessment of perceived vulnerability to the threat (eg: Health Belief Model).

So it is necessary to convey the messages of health risks in different ways, like gain-framed" messages (emphasising the benefits from adopting a behaviour) as opposed to the costs of not adopting the behaviour ("loss-framed" messages). The same information can be given but the framing is varied - eg: "smoking kills" (loss-framed) versus "reducing smoking improves health" (gain-framed).

However, research has found that for some health behaviours, loss-framing is more effective, and for others, gain-framing is better (Salovey and Wegener 2003).

Loss-framing messages seem to be more effective for early-detection behaviours and promoting screening behaviour (eg: breast self-examination or mammography). For example, Banks et al (1995) compared the effectiveness of two fifteen-minute video (gain or loss-framed) messages to encourage women in a large US telephone company to utilize mammography. Measures were taken after six and twelve months. For the group who saw "The Benefits of Mammography" (gain-framed video) 51.5% had obtained a mammogram within 12 months. But the loss-framed group ("The Risks of Neglecting Mammography"), the figure was 66.2%. Schneider et al (2001) replicated this experiment with over 700 women from different ethnic groups in inner city areas. The loss-framed video produced 50% of the group to take a mammogram within six months compared to 36% for the gain-framed one.

However, gain-framing messages are more effective for prevention behaviours, like the use of sunscreen at the beach. Rothman et al (1993) compared the request for sunscreen samples among college students after reading a pamphlet about skin cancer. The gain-framed pamphlet produced the greater response (table 4).

	LOSS-FRAMED PAMPHLET GROUP	GAIN-FRAMED PAMPHLET GROUP
MALE	47%	50
FEMALE	45	79

Table 4 - The percentage of participants requesting sunscreen samples in Rothman et al (1993) experiment.

Detweiler et al (1999) confirmed these findings on a public beach. The gain-framed pamphlet produced a 71% request rate for sunscreen compared to 53% for the loss-framed message.

Rothman et al (1999) have shown both types of messages work depending upon the label given to a product, in this case, mouthwash. When it is described as preventing tooth decay, gain-framed messages were more effective as measured by intention to buy the mouthwash. But if the mouthwash was described as detecting tooth decay, loss-framed messages were more effective (table 5).

	LOSS-FRAMED MESSAGE	GAIN-FRAMED MESSAGE
MOUTHWASH PREVENTS TOOTH DECAY	47%	67
MOUTHWASH DETECTS TOOTH DECAY	73	37

Table 5 - The percentage of participants saying they intended to purchase the mouthwash in Rothman et al (1999) study.

The authors explain the findings using Prospect Theory (Kahneman and Tversky 1979) from economics. Simply, when faced with losses, individuals are more risky in their decision-making than when faced with gains. For example, a situation of accepting a loss of £200 or gamble with 50% risk of doubling the loss or wiping it off, individuals are more likely to gamble. But if the same situation is used but with gains, individuals tend not to gamble.

Tversky and Kahneman (1981) offered their participants the choice of a sure gain of £250 against a 25% chance of £1000, and only 16% took the gamble. But in a choice of a sure loss of £750 against a 75% chance of £1000 loss, 87% gambled.

In terms of health behaviour, where they are choices that involve risk or uncertainty, individuals are more

likely to take risks when information is framed in terms of losses. Where there appears to be a certain outcome, individuals are more influenced by the benefits of the options (Salovey and Wegener 2003).

WORRY AND HEALTH

The principles outlined above will be mediated by worry. Worry can be defined as "unwanted, and perhaps uncontrollable, thoughts about a threatening outcome" (McCaul and Mullens 2003) ⁽¹⁾. In terms of health, could it be beneficial in motivating individuals to change their behaviour? Could it motivate individuals, for example, in cancer screening behaviours?

"Worry probably increases self-protective behaviours in the context of breast cancer screening" (McCaul and Mullens 2003 p151). For example, Swanson et al (1996) found that of those women in the UK who were "very worried" about breast cancer, 74% performed breast self-examination compared to 66% of those women who did not worry. But this was a retrospective study based on participants' recall of information.

In a prospective study, McCaul et al (1998) found a significant correlation between worry and subsequent breast self-examination ⁽²⁾.

Worry has also been noted in relation to other health behaviours: for example, the motivation to quit smoking among college students (McCaul and Mullens 2003); the motivation to obtain vaccination for Lyme disease in high risk groups in the USA (Cuite et al 2000); and to seek out radon testing (Weinstein and Sandman 1992).

McCaul and Mullens (2003) are clear about worry as a motivating force in some health behaviours, so does this mean that the use of health messages that increase worry should be used? There are still some researchers who argue that worry can lead to denial and act as a barrier to health-promoting behaviour (eg: Cameron 1997), or that the curvilinear relationship stills exists (eg: Miller et al 1996). All in all, some worry or fear about health is beneficial to motivating "good" health behaviour. But how much is "some, and should the health messages try to increase it?

FOOTNOTES

1. The psychology of worry generally is explored in Curtis (2001), and a cognitive model is proposed in Tallis and Eysenck (1994). Worry is rarely studied in relation to health behaviour (McCaul and Mullens 2003).

2. Fuller details of studies on relationship between worry and breast cancer screening in McCaul and Mullens (2003).

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Adherence

INTRODUCTION

A commonly used definition of adherence is "the extent to which a patient's behaviour (in terms of taking medication, following a diet, modifying habits, or attending clinics) coincides with medical or health advice" (Haynes 2001). Generally research findings about the level of adherence are depressing. The adherence rate for prescribed medication, for example, can vary from 0% to 100% (Sackett and Snow 1979).

This has led to research into programmes to encourage adherence, particularly for self-administered medications. McDonald et al (2002) performed a systematic review of such studies. The studies which produced improvements in adherence included a combination of information, counselling, reminders, self-monitoring, reinforcement, and additional attention or supervision. Generally such methods are labour-intensive, and only produce modest effects. Table 6 shows some examples of studies and techniques to improve adherence.

CONDITION	STRATEGIES THAT SIGNIFICANTLY IMPROVED ADHERENCE
short-term medication	special counselling and written instructions on medication to take all pills (Colcher and Bass 1972)
hypertension medication	worksite care by nurses, self-monitoring of blood pressure, and rewards for higher adherence (Logan et al 1979)
asthma medication	pamphlet, workbook, counselling, telephone follow-up, and support group (Bailey et al 1990)
diabetes medication	self-care education calls and nurse follow-up (Piette et al 2000)
HIV medication	individual counselling, and detailed treatment information (Knobel et al 1999 quoted in McDonald et al 2002)
epilepsy medication	counselling, leaflet, mailed reminders for appointments and missed drug refills (Peterson et al 1984)

Table 6 - Examples of strategies that significantly improved adherence to medication.

Haynes et al (2002) summarised the findings for improving both short-term (treatment for less than 2

weeks) and long-term adherence (table 7).

SHORT-TERM TREATMENT	LONG-TERM TREATMENT
<ul style="list-style-type: none">- counsel importance of adherence- written instructions- reminder packaging eg: calendar packs	<ul style="list-style-type: none">- written instructions- simplifying regimen eg: less frequent doses- counselling about regimen- support groups- reminders for medication- reinforcement schemes- self-monitoring- involving family members

Table 7 - A summary of the factors that improve short-term and long-term adherence to medication.

ADHERENCE AND ANTI-RETROVIRAL MEDICATION

Anti-retroviral medication is used with individuals diagnosed as HIV+, and it is very demanding and complex. For example, one drug must be taken every eight hours on an empty stomach, at least two hours after the last meal, and one hour before the next food (Kalichman 1998). The regimen involves taking many pills per day at different times, and they have many side effects. For the medication to be successful, adherence must be in the 95% range. However, often adherence is much lower (eg: Murphy et al 2000 - full adherence of 41% (1)).

It is important for psychologists to try and understand why in a potentially fatal situation, individuals will not adhere to their medication. The answer to this question is not simple, nor is it a single decision to adhere or not. Fisher, Fisher and Harman (2003) have applied the Information-Motivation-Behavioural Skills (IMB) Model (Fisher and Fisher 1992) to explain this behaviour.

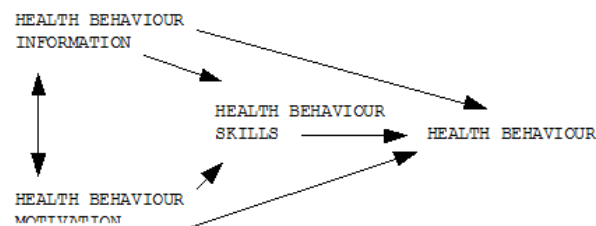
The model was originally developed to explain risky health behaviour and the motivation to change such behaviour. It focuses upon health-related information, motivation, and behavioural skills (figure 5).

The application of the IMB Model to adherence has led to some changes from the original version of the model:

a) changes in terminology; eg: "health behaviour information" becomes "adherence information";

b) the addition of an extra part of "health outcomes", which feeds back to earlier parts of the model;

c) the inclusion of a set of "moderating factors affecting adherence".



(After Fisher and Fisher 1992)

Figure 5 - Information-Motivation-Behavioural Skills Model of health.

Each part of the model is influenced by various factors (figure 6):

1. "Adherence information" - this refers to relevant information about the medication, including when and how to take (eg: with or without food), side effects (2), and interaction with other drugs. Also "adherence-related heuristics" (ie: cognitions) like "if I feel good I must be adhering at a sufficient level", or beliefs that it is alright to stop medication for weekends ("periodic drug holidays").

2. "Adherence motivation" - factors here include attitudes, and social norms. Attitudes are the personal views of individuals about adherence, and social norms relate to the "perceptions of significant others' support for adherence".

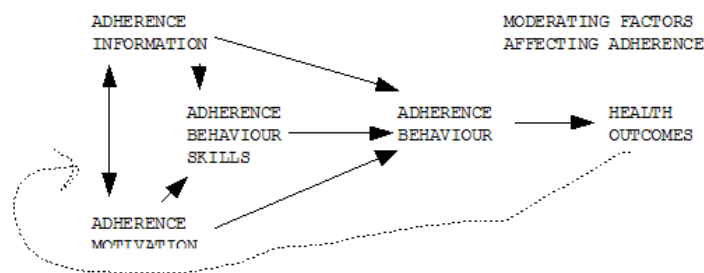
3. "Adherence behaviour skills" - this part of the model includes the ability to carry out the medication regimen (like maintaining a supply of the drugs), and the perceived self-efficacy. This is the individual's belief that they have the skills to do this.

4. "Adherence behaviour" - this is measured by proper drug dosing consistently over time.

5. "Health outcomes" - these can be measured both objectively (eg: viral load of HIV in blood) and subjectively (eg: self assessment of well-being).

6. "Moderating factors affecting adherence" -

includes factors like access to medical services, and living situation (eg: homelessness).



(After Fisher, Fisher and Harman 2003)

Figure 6 - IMB Model applied to adherence to medication.

ADHERENCE AND MEDICATION FOR MENTAL DISORDERS

The most important effect of non-adherence to medication, particularly when it is used to control rather than cure symptoms, is the potential for relapse. In the case of serious mental illness, relapse is a major concern.

Rittmannsberger et al (2004) looked at the extent of non-adherence of medication in the month before 95 individuals with "psychotic disorder" (ICD-10 category) were admitted to hospital in Austria in 1998-9. Overall 57% of the sample showed partial or full adherence in the month studied. For specific drugs, for example, 53% of those on anti-depressants took them "as prescribed" and 27% "did not take at all", compared to 45% and 30% respectively for atypical anti-psychotics.

The researchers noted that the non-adherence group had more compulsory treatment compared to those who fully or partially adhered, and more impaired insight into their disorder. Non-adherence was also linked to more days as an inpatient in the following year (mean of 73.2 days as opposed to 19.2 days).

Studies have found that family intervention and counselling improve adherence for medication among patients with schizophrenia (eg: Zhang et al 1994), while treatment information improves anti-depressant adherence (Peveler et al 1999). But 4-6 sessions of compliance therapy are needed to improve adherence for individuals with acute psychosis (Kemp et al 1998) ⁽³⁾.

Pampollona et al (2002) reviewed studies on patient

adherence for depression medication, and found key factors associated with adherence. These factors included lack of side effects, less severe symptoms (ie: non-emergency referral), and less co-morbidity (with personality disorders or substance abuse, for example). In terms of improving adherence, the researchers found some benefits from education of the patient about the side effects.

ADHERENCE TO EXERCISE PROGRAMMES

Adherence to medication involves the taking of a medication, and then surviving the side effects, but adherence to behaviour change programmes involve much more. Most importantly, a change in lifestyle.

Adherence to exercise programmes involve major changes in lifestyle for sedentary individuals to fit the exercise into the day, but also the consequences of feeling tired afterwards, for example. Are there factors that influence adherence to such programmes?

Wilbur et al (2003) looked at adherence to a 24-week home-based walking programme among 153 working US women. All the women were aged between 45-65 years, and had sedentary lives (less than twenty minutes leisure-time physical activity twice a week). The aim of the programme was to reduce the cardiovascular disease risk. The programme was based around 20-30 minutes of continuous walking four times a week. The average adherence to the programme was 66.5% of expected walks, but as low as 6% for one participant.

Higher self-efficacy (ie: level of woman's confidence in ability to overcome barriers) was a key to adherence, but also surprisingly less previous exercise experience. Women who had been physically active in the past may well have had unrealistically optimistic views about the programme which, in fact, produced poor adherence. Personal control of the programme through time and place of walking seemed to matter also.

Other factors that influence adherence to exercise include specific social support, like a friend to exercise with (Wing and Jeffrey 1999) or a personal trainer (Jeffrey et al 1998), and individuals high on the Consideration of Future Consequences Scale (Ouellette et al 2002 quoted in Gibbons, Gerrard and Lane 2003).

FOOTNOTES

1. Murphy et al (200) studied 161 13-18 year-olds on HAART (highly active antiretroviral therapy) in thirteen

US cities, and found that 7% could not correctly identify all their medication, 11% could identify them but did not take one, and 83% took all the medication but only some of the time. Full adherence was calculated as 41%).

2. Headache, fever, and nausea are common with most antiretroviral medication, as well as more severe side effects in some cases (eg: anaemia) (Poppa 2001).

3. O'Donnell (2003) studied the benefits of compliance therapy with schizophrenia patients.

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Health Issues: Establishing the Facts/Evaluating the Evidence

INTRODUCTION

Reports in the media about health-related issues take up a great deal of time and space. But often the reports are about a risk or "health scare", which then develops a life of its own ⁽¹⁾. Thus the need to establish the actual evidence and facts.

SEDENTARY BEHAVIOUR AND OBESITY IN CHILDREN: IS TELEVISION TO BLAME?

Recent figures suggest that obesity among children in Britain is increasing: from 5% of 5-15 year-olds in 1990 to 16% in 2001 (BBCi 2004) ⁽²⁾.

An everyday explanations put forward for the growing level of obesity is lack of physical activity, and sedentary behaviour due to "couch potato-ism", and increased car use. It is also felt that children play less sport, though there was a small increase in hours of sport and exercise between 1999-2002 (Sport England 2003).

It is first necessary to define "sedentary behaviour". Bernstein et al (1999) defined it as "expending less than 10% of.. daily energy in performing moderate or high intensity activities". More practically, it can be less than 30 minutes of moderate intensity activity on most days (Department of Health and Human Services and Centers for Disease Control and Prevention 1996).

But Biddle et al (2003) felt it was also necessary to know what behaviour is being performed when individuals are sedentary rather than just defining sedentary behaviour as a lack of physical activity. Boseley (1998) quoted research that 15 year-olds, on average per week, spent 6% of their time exercising and 17% of the time "sitting".

The general assumption made by stories of children's lack of physical activity is that televisions or computers have replaced physical activity - known as the "displacement hypothesis" (Mutz et al 1993). For example, it is estimated that children watch 2.5 hours of television per day, play video games for 30 minutes, and other use of the computer for 45 minutes per day (Gorely et al 2003 quoted in Biddle et al 2003).

Marshall et al (2002) surveyed 2494 11-15 year-olds

in the USA and UK, and found that high levels of television viewing and video-game playing were associated with high levels of physical activity by the same individuals over a period of a month. In other words, the opposite to predicted by the "displacement hypothesis". Meta-analysis of studies found support for these findings (Biddle et al 2003).

In fact, sedentary media use is very similar between the 1950s (37 hours per week - television, radio, records, comic books) for teenagers (Schramm et al 1961) and today (Roberts et al 1999 quoted in Biddle et al 2003).

Furthermore, meta-analysis of other studies found little relationship between television viewing and increased body fatness (Biddle et al 2003). Generally, sedentary behaviour through television viewing is not the problem for Biddle et al (2003), but it is increased car use (ie: children driven to school) that is key for them.

MMR VACCINE AND SIDE-EFFECTS: METHODOLOGICAL ISSUES

Arguments over the safety of the combined Mumps, Measles and Rubella (MMR) vaccine have raged since its introduction in 1988 in the UK, and the concerns have particularly become newsworthy in the last few years. The concern and debate over the safety today is summarised in Mills (2002).

As with any area of psychology, the accuracy of the conclusions from the research will depend upon the methods used. Here are some of the key recent studies of the side effects of the MMR vaccine with the emphasis upon the methodology used.

1. Wakefield et al (1998) Case reports

This article is a summary of twelve case reports (11 male and one female children aged 3-10 years-old) who had a history of normal development followed by a loss of acquired skills, and gastrointestinal problems, as well as behaviour problems among eight of them. These problems were associated by parents or physicians with the MMR vaccine, with links made between 24 hours and two months after vaccination. Wakefield et al reported 40 more patients as an addendum to the article.

The initial response to this report appears in the letter section of the "Lancet" 21/3/98.

Strengths of the method/study

i) Case reports give details of the symptoms of the children based on physical examination and full medical history. Table 8 shows the cases with behavioural problems.

ii) Insight can be gained from studying specific cases in detail.

Weaknesses of the method/study

i) Small number of cases.

ii) Sample bias - patients identified by referral to particular hospitals (Hendrickson and Turner 2002).

CASE NO.	MMR VACCINE	INTERVAL FROM EXPOSURE TO VACCINE AND FIRST SYMPTOMS	AGE OF ONSET OF FIRST SYMPTOMS
1	yes	1 week	12 months
2	yes	2 weeks	13 months
3	yes	48 hours	14 months
5	no	/	18 months
6	yes	1 week	15 months
7	yes	24 hours	21 months
11	yes	1 week	15 months
12	no	/	16 months

(After Wakefield et al 1998)

Table 8 - Eight cases with behaviour problems in Wakefield et al (1998) study.

iii) No control group

iv) Difficult to isolate the actual onset of problems; ie: exact causal relationship (Stratton et al 2001), particularly as the parents and physicians made the association between problems and the MMR vaccine.

Thus the accuracy of the observations is questioned: "False attribution usually occurs because many developmental abnormalities first manifest in the early years of life, which is also when several vaccines - which can cause, crying, fever, and, occasionally, febrile seizures - are given" (Chen and DeStefano 1998 p612).

Furthermore, Taylor et al (2002) reported evidence of parents changing their reporting behaviour to doctors since the public concern about the MMR vaccine. Before

the publicity, parents reported any problems earlier in the child's life.

2. Peltola and Heinonen (1986) Experimental study

This is the report of a Finnish double-blind placebo controlled trial with 581 pairs of twins. One co-twin was given the MMR vaccine, while the other a placebo injection. The presence of side-effects to the vaccine were measured after 21 days, and found to be between 0.5-4.0%. More frequent respiratory problems, nausea, and vomiting were found in the placebo group, in fact.

Strengths of the method/study

i) Because this is an experiment, it is a prospective study which can predict cause and effect, measure behaviour precisely, and allows for replication.

ii) It has the experimental controls of comparison groups, which are twins, as well as double-blinded to avoid "experimenter effects" or "demand characteristics".

Weaknesses of the method/study

i) The study was short-term, and only measured immediate side-effects. Furthermore, it did not measure behaviour problems or pervasive developmental disorder.

ii) Ethical concerns about giving young children a placebo injection. However, parental permission had been sought.

3. Taylor et al (1999) Case-series analysis

This report is an epidemiological study based around all the children born between 1979-92 in eight North Thames health districts who were diagnosed with autism (498 cases).

The researchers were interested in three issues:

a) The number of cases of autism diagnosed each year before the introduction of the MMR vaccine in 1988, and in each year afterwards.

The researchers found "no sudden 'step-up'" in number of cases of autism diagnosed after the introduction of the MMR vaccine. It would be expected that cases of autism would show a dramatic increase in the years after 1988 if MMR vaccine was the cause.

b) The age of diagnosis of autism between individuals not vaccinated, and those vaccinated before and after age 18 months. The vaccine is usually given at between 12-15 months of age. "The age of diagnosis was found to be independent of whether MMR vaccine was given.." (Taylor et al 1999 p2028).

c) The vaccination of children and the onset of autism.

The researchers found no association between the MMR vaccine and the onset of autism within the following one-two years.

Strengths of the method/study

i) This method can establish causal associations between variables over time, for example, by focusing on the age of diagnosis of autism, and vaccination age.

ii) It is sometimes the only feasible method when an event is rare (Thompson and Cullum 1999).

iii) The study had population controls.

Weaknesses of the method/study

i) It is a retrospective study based on analysis of statistical data.

ii) This type of study is unlikely to identify a relation between exposure and disease when there is a delay in diagnosis (Wakefield 1999). But Taylor, Miller and Farrington (1999) defended the study and method used.

4. Kaye et al (2001a) Time trend analysis

This study is a more comprehensive version of Taylor et al (1999) study based on data from the General Practitioners Research Database (3) in the UK. The researchers focused upon the children 12 years or younger (305 cases) diagnosed with autism between 1988-99, and, in more detail, 114 boys 2-5 years old born between 1988-93 and diagnosed with autism.

The data showed an increase in the number of children diagnosed with autism from 0.3 per 10 000 person years in 1988 to 2.1 in 1999. But during that period, the "MMR coverage" was 95% (ie: number of children receiving vaccine). If autism was linked to the MMR vaccine, there should be a correlation between the two variables. Thus

because autism was increasing but the "MMR coverage" remained the same, the researchers concluded there was no correlation.

If MMR were a major cause of the increased incidence of autism then the risk of autism in successive birth cohorts would be expected to stop rising within a few years of the vaccine being in full use (Kaye et al 2001 p462).

Strengths of the method/study

i) Use of comprehensive records from the GPRD including vaccination records for all children.

ii) This method is able to show causal associations in the data over time.

iii) Replication possible.

A similar study was performed in Denmark of all children born between 1991-8 (Madsen et al 2002), which confirmed the findings here. The researchers found that 345 of 440 655 MMR-vaccinated children and 77 of 96 648 non-vaccinated children developed an autistic spectrum disorder. The adjusted relative risk from MMR was 0.83 for vaccination.

Weaknesses of the method/study

i) It is a retrospective study based upon statistical data. The researchers did not review the full clinical records of the children to check accuracy of diagnosis of autism, for example (Smeeth et al 2001).

ii) The data from GPs may be incomplete, or contain clerical errors (for example, in classification).

iii) The uptake of MMR is unlikely to have been 90-95% in the first year of introduction in 1988 (Yazbak 2001).

iv) The study excludes children born before 1988 who may have been vaccinated after 1988 (Yazbak 2001).

v) It is assumed that the diagnosis of autism after onset was constant each year, and that mild cases would always be diagnosed (Edwards and Baltzan 2001).

But Kaye et al (2001b) reply to these criticisms.

5. Peltola et al (1998) Longitudinal study

This study was based upon official records of the Finnish National Board of Health and the National Public Health Institute. It concentrated upon 31 individuals who developed gastrointestinal problems after the MMR vaccine in 1982-6. These individuals were followed for fourteen years to see how many of them developed an autism spectrum disorder. There were no cases.

Strengths of the method/study

i) Prospective study which is seen as less bias than a retrospective study as information is recorded before the outcome (Brewer 2002).

ii) It is long-term study.

iii) The use of comprehensive data source.

Weaknesses of the method/study

i) The data source depends upon the accuracy of reporting to health authorities in Finland. Le Page and Ainsworth (2001) called it "passive surveillance".

ii) Small sample studied.

iii) There was no control group.

COMPLEMENTARY AND ALTERNATIVE MEDICINE - DOES IT WORK?

There is a growing interest in recent years in treatments and therapies which differ from the traditional biomedicine model. A UK phone survey found that 20% of respondents have tried some form of complementary and alternative medicine (CAM) in the last year (Ernst 2000).

There are many and varied options available under the heading of "CAM", from acupuncture, and homoeopathy, to psychic surgery, and bio-energetics. Thus it is important to establish whether any of these treatments and therapies "work".

Critics have argued that any apparent benefits are no more than just a placebo effect. However, placebo effects are possible with any type of medicine (Walach 2003).

The journal, "Focus on Alternative and Complementary Therapies" (FACT) was set up to summarise the findings of

rigorous scientific research into CAM. The journal appears six times a year.

Table 9 lists a selection of examples of key recent studies on CAM.

HOMOEOPATHY	Crawford and Jones (2001) review of 16 trials Long (2001) 4 trials of use with perennial allergic rhinitis
SPINAL MANIPULATION	Lawrence (2001) 8 trials with "sham-controls"
MASSAGE	Ernst (2003) systematic review of use with lower back pain

Table 9 - Examples of studies reporting scientific research on CAM.

Clinical Trials

Medicines are traditionally tested in clinical trials to assess whether they improve the symptoms of an illness. The best type of clinical trials are randomised controlled trials (RCT), and CAM can be assessed using such methods.

A well-designed RCT should involve the following (Brewer 2002):

- a) Placebo control group;
- b) Appropriate measurement of baseline and changes;
- c) Control of equality in symptoms between groups and participants;
- d) Random allocation of participants to active or placebo groups;
- e) The use of "blinding" to hide knowledge of who is in the active group or the placebo/control group until the end of the trial.

These criteria can be applied to a study of the use of St Johns Wort (hypericum) with depression - Woelk (2000).

This study was a randomised, multicentre (40 outpatient clinics), double-blind, parallel group trial in Germany comparing St Johns Wort to an anti-depressant (imipramine). The participants (324) suffered from mild to moderate depression, as measured by the Hamilton Rating Scale for Depression (HRSD) (Hamilton 1967).

Participants either received 75mg of imipramine

twice a day, or 250mg of hypericum extract ZE117 twice a day, for six weeks. Comparisons of HRSD scores at the beginning and end of the study showed that both groups improved equally - the HRSD scores on average halved in both cases. Thus Woelk concluded that St Johns Wort was equally as effective as imipramine for mild to moderate depression.

As with any clinical trial, this study can be scrutinized and evaluated. For example, this study was criticised for being short-term only (Cornwell 2001); using an outdated anti-depressant for comparison (Spira 2001); having no placebo group (Volp 2001); increasing the imipramine dosage during the study (Alkhenizan 2001); and for the statistical analysis (Stevinson 2001). Future studies can now improve the design of such clinical trials.

Obesity

Another way of assessing CAM is to compare the studies on a particular condition by different types of CAM.

Pittler (2002) reviewed the studies of four types of CAM for obesity:

i) Acupuncture - 5 RCTs are reported, and no significant effect is found for acupuncture over sham-acupuncture in reducing body mass index.

ii) Herbal medicine - varied findings are reported. For example, evidence for weight loss with three Ayurvedic herbal formulations (eg: Gokshuradi guggul) (1 RCT), but not for guar gum (meta-analysis of 20 RCTs).

iii) Hypnotherapy - a limited number of studies showed that hypnotherapy in addition to cognitive-behavioural therapy gives a small improvement in weight loss compared to cognitive-behavioural therapy alone.

iv) Dietary supplements - the results are conflicting here.

Pittler concludes that "Few encouraging findings exist for complementary treatments in the management of obesity", except for hypnotherapy in addition to other treatments.

Conclusion

Establishing the scientific evidence for the

effectiveness of CAM is important, but research has shown that individuals may not pay attention to such evidence.

In an experiment with US college students and their views of aromatherapy, Suls (2003) found that students paid more attention to a CAM practitioner for information about aromatherapy than to a GP. It was a decision to choose the "appropriate expert" to pay attention to for information, irrelevant of whether the students had used aromatherapy themselves.

LOW-CARBOHYDRATE DIET PROGRAMMES - DO THEY WORK?

Large numbers of people are participating in dietary programmes each day (eg: 45% of women and 30% of men in the USA; Serdula et al 1999), and there is a lot of money to be made from "successful" dieting products.

The dieting programme that is currently most popular is based around the "Atkins Nutritional Approach" (ANA) (4). Simply, this is a low-carbohydrate, high-protein, high-fat diet. In practice, the full ANA programme involves a number of phases, concepts like "Net Carbs", and the availability of recommended supplements, like "Atkins Essential Omegas" (Atkins Nutritional Approach 2003).

This dieting programme is different to a number of "conventional" programmes which focus upon low-fat intake (5). But does the difference in approach account for the claims of success of the ANA? Obviously, evidence is needed to answer this question, or a question about the effectiveness of dieting programmes generally.

Here are the details of two recent studies of low-carbohydrate diets.

1. Samaha et al (2002)

This study looked at the effectiveness of two types of diet programmes among 132 severely obese individuals in Philadelphia over a six month period. The participants had a body mass index of at least 35 (6), and many suffered from diabetes or the metabolic syndrome.

Group 1 was instructed to restrict their carbohydrate intake to 30g per day ("low-carbohydrate" group), while group 2 were asked to control their overall calorie intake of which less than 30% of intake were to be from fat ("low-fat" group).

The "low-carbohydrate" group, at the end of six months, had lost significantly more weight (mean loss of 5.8kg) than the "low-fat" group (mean loss 1.9kg). There were also benefits in insulin sensitivity, for example.

However, the authors themselves are cautious about

endorsing a "carbohydrate-restricted" diet from this study because it is not clear whether the weight loss in the "low-carbohydrate" group was due to better adherence to the diet than the actual programme itself.

Criticisms of study

i) Groups not randomised because the researchers wanted equal numbers of women, and participants with diabetes, for example, in each group.

ii) Study was not "blinded"; ie: both participants and researchers knew who was in which group.

iii) Short length of study - six months only.

iv) High drop-out rate from the study - 47% of the "low-fat" group and 33% of the "low-carbohydrate" group by the end of the study. Also ethnic differences in drop-out with over half the African-Americans in the study not completing.

v) Participants on the "low-carbohydrate" diet attended more dietary counselling sessions during the study than the other group.

vi) The sample was very specific; ie: severely obese individuals.

vii) The problem of maintaining adherence to the diet programmes over the six months of the study.

viii) Participants were allowed to choose their own foods to eat within the restraints of the study. Thus there was no control over that food; eg: the proportion of complex carbohydrates or the ratio of carbohydrate to fibre. Both these affect weight loss.

2. Foster et al (2003)

This is a multi-centre controlled trial over one year comparing the "Atkins diet" (low-carbohydrate, high-protein, high-fat) with a "conventional" diet (low-calorie, high-carbohydrate, low-fat).

This American study used 63 individuals classed as obese, who were assigned by random-number generator to either group. The "Atkins diet" group were instructed to follow the Atkins (1988) book, while the other group were asked to follow "The LEARN Program for Weight Management" (Brownell 2000).

The "Atkins diet" group showed significantly more

weight loss at 3 and six months, but not at 12 months (table 10).

The authors have reservations about their findings because of the poor adherence and attrition rates. There was also evidence of weight regain in the "Atkins diet" group in the second half of the year of the study.

	ATKINS DIET	CONVENTIONAL DIET	SIGNIFICANT
3 MTHS	-6.8	-2.7	0.001
6 MTHS	-7.0	-3.2	0.02
12 MTHS	-4.4	-2.5	ns

(ns = not significant)

Table 10 - Mean percentage of body weight lost from baseline measure.

Criticisms of the study

i) There was limited contact between the participants and dieticians throughout the study - 30 minutes at three, six and 12 months.

ii) High drop-out from the study - 41% of participants (ie: 37 participants completed study including 20 in "Atkins diet" group).

iii) No control upon adherence to the prescribed programme. Participants were instructed to read and follow the book given -ie: self-help format to study.

iv) The sample was specific; ie: individuals with an average body mass index of 33.

v) The participants knew which group they were part of. This is particularly important with the high level of general publicity about the ANA.

Conclusion

At the moment, the scientific jury is out over the benefits of low-carbohydrate diets.

Interestingly, the Atkins Nutritional Approach (2003) quotes both the above studies as scientific evidence to support the ANA in its publicity material. Results from studies, like those detailed above, should not be generalised without caution.

Establishing the effectiveness of dieting programmes and products is always difficult, particularly when large

sums of money are to be made from their sale (eg: an estimated 10 million copies of the Atkins book had been sold by 2003; Foster et al 2003).

FOOTNOTES

1. This is sometimes called a "moral panic" (Cohen 1973). Technically, this term refers to the exaggeration of deviant behaviour by the media.

But, in relation to health, it can be used to mean the focus upon a specific event as a cause or a risk, usually when there is limited scientific evidence, or in contradiction of the evidence. In a number of cases, there is an "apocalyptic feel" to the health risk.

2. Obesity is usually defined by Body Mass Index (BMI) above 95-98th centile for the UK age-specific population; ie: weight of heaviest expected individuals in a normal distribution curve (Reilly et al 1999; Kinra 2000). BMI is weight (in kilograms) divided by height squared (in metres). The normal range of BMI is seen as 20-25 (Seidell and Flegal 1997). Mulligan (2000) questions the use of BMI with children.

3. GPRD is a database set up in May 1987 to keep comprehensive records of information from GPs, and is now managed by the Office for National Statistics (Walley and Mantgani 1997).

4. The ANA comes from the original Dr. Atkins book published in 1973, and revised in 1998 (Atkins 1998).

5. The "conventional" view of diet suggests half the intake from carbohydrates, a quarter from proteins, and the remainder from fats. The ANA proposes a change from carbohydrates as fuel for the body to using fat as fuel by reduced carbohydrate intake. Thus the body burns fat which reduces fat.

The long term health effects of this change in eating behaviour are being debated ("Equinox: Atkins Diet - Fat or Fiction" 2003; Channel 4 Television).

6. See footnote no.2.

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